ABSTRACT OF DISCLOSURE

Apparatus and methods of fabricating an under bump metallization structure including an adhesion layer abutting a conductive pad, a molybdenum-containing barrier layer abutting the adhesion layer, a wetting layer abutting the molybdenum-containing barrier layer, and high tin content solder material abutting the wetting layer. The wetting layer may be substantially subsumed in the high content solder forming an intermetallic compound layer. The molybdenum-containing barrier layer prevents the movement of tin in the high tin content solder material from migrating to dielectric layers abutting the conductive pad and potentially causing delamination and/or attacking any underlying structures, particularly copper structures, which may be present.